

USSR

- LIVANOV, M. N., Problemy Prostranstvennoy Sinkhronizatsii Biopotsialov Golovnogo Mozga, Proceedings of a symposium (9-11 June 1971), Pushchino na Oke, Akademiya Nauk SSSR, 1973
- KhRIZMAN, T. P., "Characteristics of Spatial Synchronization in Brain Biopotentials in Children of Various Ages Under the Effect of Verbal Signals" 131
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LIVANOV, M. N., Problemy Prostranstvennoy Sinkhronizatsii Biopotsentsialov Golovnogo Mozga, Proceedings of a symposium (9-11 June 1971), Pushchino na Oke, Akademiya Nauk SSSR, 1973

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USSR

UDC 669.71.018.9.4

LIVANOV, V. A., KUZNETSOV, K. I., and GOROKHOV, V. P.

"Influence of Technological Factors on the Purity of Aluminum Melts"

Tr. Mosk. aviats. tekhnol. in-ta (Works of Moscow Aviation Technological Institute), 1970, vyp. 71, pp 81-88 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No G236 by authors)

Translation: The authors studied the character of the reaction of hydrogen with aluminum oxides during the smelting of alloys under industrial conditions and showed the feasibility of refining aluminum and its alloys to assure the production of high-purity metals. The refining technology consists of letting hydrogenated melts stand in the furnace with the subsequent injection of nitrogen into them in a mixer. Two illustrations.

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USSR

UDC 669.296:620.186:539.56:669.788

LIVANOV, V. A., KOLACHEV, B. A., and BUKHANOVA, A. A.

"Influence of Hydrogen on the Structure and Properties of Zirconium"

Tr. Mosk. aviats. tekhnol. in-ta (Works of the Moscow Aviation Technological Institute), 1970, vyp. 71, pp 23-26 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 I791 by the authors)

Translation: The predominant form of hydrogen embrittlement in zirconium and its alloys is hydride embrittlement, which develops at high rates of deformation, particularly in impact tests under low-temperature conditions. Hydride embrittlement in zirconium is manifested in the event of hydrogen content  $> 0.005\%$ . In hardened zirconium specimens, hydride embrittlement of the second kind, which develops at low rates of deformation, is found. Four illustrations. Bibliography of five titles.

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USSR

UDC 669.71.41

LIVANOV, V. A., GOROKHOV, V. P., KOLACHEV, B. A., KOFMAN, L. M., and  
SKUCHILOV, A. I.

"Filtration of Aluminum Melts Through Aluminum Oxide With Simultaneous  
Degasification by Neutral Gases"

Tr. Mosk. aviats. tekhnol. in-ta (Works of Moscow Aviation Technological  
Institute), 1970, vyp. 71, pp 88-93 (from RZh-Metallurgiya, No 12, Dec 70,  
Abstract No 12 G230 by authors)

Translation: The article presents a theoretical estimate of the quantity of  
neutral gas which must be passed through a melt in order to decrease the gas  
content a given number of times. The theoretical calculations agree well  
with the experimental data obtained during the degasification of aluminum  
with neutral gases and nitrogen. The gas content of aluminum is decreased  
especially effectively when aluminum is filtered through  $Al_2O_3$  with simul-  
taneous degasification by neutral gases. Two illustrations. One table.  
Bibliography of four titles.

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Titanium

USSR

UDC 669.295.5

KOLACHEV, B. A., LIVANOV, V. A. and ZHURAVLEV, L. N. (Moscow)

"On the Selection of the Composition of Titanium Alloys with a Negligible Tendency toward Hydrogen Brittleness"

Moscow, Izvestiya AN SSSR, Metally, No 3, May-Jun 70, pp 158-164

Abstract: The authors classify hydrogen brittleness of titanium alloys into two major groups. The first is determined by causes existing in the initial metal due to high hydrogen content. The second is determined by sources developing in metal with a high hydrogen content during plastic deformation. The tendency and the sensitivity of  $\alpha$  and  $(\alpha-\beta)$  titanium alloys to hydrogen brittleness are investigated. The influence of  $\beta$ -phase quantity on maximum hydrogen concentrations in  $(\alpha + \beta)$  alloys in the development of both brittleness aspects is analyzed on the basis of available data. An expression is derived for the average hydrogen concentration in the  $(\alpha + \beta)$  alloy at which the  $\beta$ -phase becomes brittle. The stabilizing effect of alloying metals is considered. It is stated in conclusion that: 1) the tendency of  $\alpha$ -alloys to hydrogen brittleness can be reduced by increasing the aluminum content, which increases the solubility of hydrides in the  $\alpha$ -phase; 2) the sensitivity of  $(\alpha + \beta)$  alloys to hydrogen brittleness can be reduced by increasing the  $\beta$ -phase share, by increasing the critical hydrogen concentration in the  $\beta$ -phase, above which the embrittlement begins, and by reducing

USSR

KOLACHEV, B. A., et al., Izvestiya AN SSSR, Metally, No 3, May-Jun 70, pp 153-164

the correlation of hydrogen concentration in the  $\beta$  and  $\alpha$  phases. All this can be achieved by an appropriate selection of ( $\alpha + \beta$ ) alloy composition or conditions of their heat treatment.

2/2

1/2 035 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--SELECTION OF THE CHEMICAL COMPOSITION OF TITANIUM ALLOYS WITH A LOW  
SUSCEPTIBILITY TO HYDROGEN INDUCED BRITTLENESS -U-  
AUTHOR-(Q3)-KOLACHEV, B.A., LIVANOV, V.A., ZHURAYLEV, L.N.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK SSSR. IZVESTIIA METALLY, MAY-JUNE 1970, P 158-164

DATE PUBLISHED-----70

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TOPIC TAGS--HYDROGEN EMBRITTLEMENT, BIBLIOGRAPHY, TITANIUM ALLOY, HYDRIDE,  
BETA PHASE, METAL HEAT TREATMENT, CHEMICAL COMPOSITION

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2/2 035 UNCLASSIFIED PROCESSING DATE--04DEC70  
CIRC ACCESSION NO--AP0140218  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REVIEW OF THE POSSIBLE CAUSES OF HYDROGEN INDUCED BRITTLENESS OF TITANIUM ALLOYS AND METHODS OF ITS PREVENTION. IT IS STATED THAT SUSCEPTIBILITY OF THESE ALLOYS TO HYDROGEN INDUCED BRITTLENESS CAN BE DECREASED BY INCREASING THE ALUMINUM CONTENT WHICH ENHANCES THE SOLUBILITY OF HYDRIDES IN THE BETA PHASE. SUSCEPTIBILITY OF ALPHA PLUS BETA ALLOYS TO HYDROGEN INDUCED BRITTLENESS CAN BE DECREASED BY THE FOLLOWING METHODS: (1) INCREASING THE AMOUNT OF THE BETA PHASE. (2) INCREASING THE CRITICAL CONCENTRATION OF HYDROGEN IN THE BETA PHASE (ABOVE WHICH THIS PHASE BEGINS TO BE BRITTLE). (3) DECREASING THE CONCENTRATION RATIO OF HYDROGEN IN THE ALPHA AND BETA PHASES. THIS CAN BE ACHIEVED BY SUITABLE SELECTION OF THE CHEMICAL COMPOSITION OF ALPHA PLUS BETA ALLOYS, OR BY SUBJECTING THESE ALLOYS TO HEAT TREATMENT UNDER SPECIALIZED CONDITIONS.

UNCLASSIFIED

USSR

Titanium

UDC 669.295

KOLACHEV, B. A., NOSOV, V. K., ~~LIVANOV, V. A.~~, SHCHIPUNOV, G. I.,  
CHUCHURYUKIN, A. D.

"Influence of Hydrogen on Technological Ductility of Ti Alloy with 9% Al"

Ordzhonikidze, Izvestiya Vysshikh Uchebnykh Svedeniy, Tsvetnaya  
Metallurgiya, No 4, 1972, pp 137-142.

Abstract: This work presents a confirmation of data on the favorable influence of hydrogen on the technological ductility of alloys with high aluminum content at hot pressure working temperatures. The favorable influence of hydrogen is manifested not only as a decrease in the temperature of the anomalous increase in plasticity related to the  $\alpha + \beta \rightleftharpoons \beta$  conversion (about 1,100° for the alloy Ti + 9% Al), but also as an expansion in the temperature interval of increase ductility for upsetting from 1,000° to 1,050°. The positive influence of hydrogen is also manifested as a significant reduction in the force of deformation throughout the entire interval of temperatures and hydrogen concentrations studied. Hydrogen has its most favorable influence in the 0.50-0.2% (by mass) concentration interval.

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Heat Treatment

USSR

UDC 669.2:620.18+621.785

KOLACHEV, B. A., LIVANOV, V. A., and YELAGIN, V. I.

Metallovedeniye i Termicheskaya Obrabotka Tsvetnykh Metallov i Splavov  
(Metallurgy and Heat Treatment of Nonferrous Metals and Alloys), Izdatel'-  
stvo Metallurgiya, Moscow, 1972, 480 pp

Translation of Annotation: The book deals with the general problems of metallurgy and heat treatment of nonferrous metals, such as aluminum, magnesium, copper, titanium, zirconium, beryllium, high-melting metals, and their alloys. Among the topics discussed are the structural and mechanical properties of nonferrous metals, as well as corrosion stability, physical properties, technology of metals and alloys, and the application of these metals in the economy. The book presents supplementary reading material for students specializing in metallurgy and can be useful to metallurgists, technologists, and engineers dealing with the application and treatment of nonferrous metals and alloys.

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USSR

AL'TSHULER, N. S., IVOYLOVA, E. Kh., LIVANOVA, I. D., STEPANOV, V. G.,  
STOLOV, A. L., Kazan' State University imeni V. I. Ul'yanov-Lenin

"Multiple-Center Structure of the Spectrum in  $\text{KMgF}_3$  and  $\text{KZnF}_3$  Crystals  
Activated by  $\text{Eu}^{2+}$  and  $\text{Gd}^{3+}$  Ions"

Leningrad, Fizika Tverdogo Tela, Vol 13, No 10, Oct 73, pp 2958-2962

Abstract: The authors analyze the EPR spectra and study the Stark structure of noncubic centers which arise when  $\text{KMgF}_3$  and  $\text{KZnF}_3$  crystals are activated by isoelectronic ions of  $\text{Eu}^{2+}$  and  $\text{Gd}^{3+}$ . The EPR spectra were measured at 9 GHz and 77°K. The constants of the spin Hamiltonian of the ground state of cubic centers of  $\text{Eu}^{2+}$  in the crystals as determined from analysis of the EPR spectra are compared with the parameters of the crystal field of the same centers. A diagram is plotted for Stark splitting of levels  $6p_{7/2}$  and  $6p_{5/2}$  for  $\text{Eu}^{2+}$  ions in centers of cubic, tetragonal, and trigonal symmetry, and also for seven active centers of  $\text{Gd}^{3+}$ . The results show indeterminacy of the  $\text{Gd}^{3+}$  ion position.

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UNCLASSIFIED PROCESSING DATE--19JUN70  
TITLE--FIRST SEISMIC INVESTIGATIONS ON THE PRIPYAT SWELL -U-  
AUTHOR--CHEKUNOV, A.V., LIVANOVA, L.P., KLUSHIN, V.I.  
COUNTRY OF INFO--USSR  
SOURCE--GEOFIZICHESKIY SBORNIK, KIEV, 1970, NR 33, PP 32-38  
DATE PUBLISHED-----70  
SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY  
TOPIC TAGS--SEISMIC WAVE, GEOLOGY, GEOPHYSIC METHOD, CRYSTALLINE ROCK  
LAYER  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1977/0391 STEP NO--UR/0000/70/000/033/0032/0038  
CIRC ACCESSION NO--AT0043963  
UNCLASSIFIED

Acc. Nr: **AT0043963**

Ref. Code: **UR0000**

PRIMARY SOURCE: **Geofizicheskiy Sbornik, Kiev, 1970, Nr 33,**  
**pp 32-38**

**FIRST SEISMIC INVESTIGATIONS ON THE PRIPYAT SWELL**

**A. V. Chekunov, L. P. Livanova, V. I. Klushin**

**(Institute of Geophysics, Academy of Sciences, Ukrainian SSR)**

**Summary**

The results are given of the first seismic investigations in the southern part of the Pripyat swell. The characteristic of the wave picture is presented. The structural constructions were conducted along the surface of the crystalline basement. The main tectonic dislocations and contacts are distinguished. The correlation with the data of geology and other geophysical methods was made.

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*Vol 12*

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Nov 1970

12

Kirillov, B. D. Shock wave parameters for explosion of a spherical charge in porous NaCl, FCIV, no. 4, 1971, 594-599.

Laboratory experiments were conducted to determine the parameters of shock waves in a solid at various porosity values within the range  $1 \leq \bar{R} \leq 9$ , where  $\bar{R} = R/R_0$  is the ratio of the distance  $R$  between the point of measurement and the charge to the charge radius  $R_0$ . The effect of rock porosity near an explosion on the explosion parameters in the medium was considered. NaCl powder with a grain size of about 0.3 mm was used to simulate the properties of natural rock. The powder was pressed to densities of  $\rho_0 = 2.12, 1.87, \text{ and } 1.72 \text{ g/cm}^3$ , and the single-crystal density was  $\rho_0 = 2.16 \text{ g/cm}^3$ . The porosity of the pressed specimens, defined by the ratio  $\pi = 1 - \rho/\rho_0$ , was 2, 11.5, and 20%. The shock-wave parameters were measured by an electromagnetic method proposed by Ye. K. Zavyazkiy. Results show that the porosity of the medium substantially affects the energy dissipation and the shock-wave parameters in the near explosion zone.

Khrustorov, B. D., Ye. E. Goller, A. Ya. Sidorin, and L. D. Livash. Manganin sensor for measuring shock wave pressure in solids, FCIV, no. 4, 1971, 613-615.

A manganin sensor and circuitry are described for recording plane shock wave pressure in a solid within the range 1 to  $10^2$  kbar. The plane shock wave in the specimen is actuated by a detonation lens (1, Fig. 1) and explosive charge (2). Variation of the charge density and the introduction

LIVASH, L. D.

USSR

UDC: 621.396.69:621.316.8

LIVCHAK, P. S.

"Investigation of the Properties of Tungsten Resistive Layers"

Elektron. tekhnika. Nauch.-tekhn. sb. Radiodetali (Electronic Technology. Scientific and Technical Collection. Radio Components), 1970, vyp. 4(21), pp 73-78 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5V299)

Translation: The paper is a report on synthesis of low-resistance thin-film tungsten resistive layers on a cylindrical ceramic base by the method of ion-plasma technology. Their properties are studied. It is shown that it is possible in principle to make low-resistance tungsten metal-oxide film resistors with a zero temperature coefficient of resistance. Resumé.

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USSR

UDC: 621.317.8

BIRINA, G. A., LIVCHAK, P. S.

"Determination of Optimum Conditions of Ion-Plasma Vaporization of Resistive Molybdenum Films With the Aid of Mathematical Methods of Experiment Planning"

Elektron. tekhnika. Nauch.-tekhn. sb. Radiodetali (Electronic Technology. Scientific and Technical Collection. Radio Components), 1970, vyp. 4(21), pp 79-86 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5V298)

Translation: The paper describes an attempt to use mathematical methods of experiment planning for studying the process of synthesis of metal-oxide resistive films by thermoreactive vaporization of molybdenum. It is shown that the principal factors in this process are the pressure of the reactive gas and the potential of the target. A computer is used to determine the optimum region of vaporization of resistive films in the plane of the principal factors. Resumé.

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USSR

UDC: 621.372.54

GIL'VARG, B. A., LIVENSKIY, G. A.

"On the Law of Distribution of Rates of Aging of Quartz Resonators"

Elektron. tekhnika. Nauch.-tekhn. sb. Radiokomponenty (Electronic Technology. Scientific and Technical Collection. Radio Components), 1970, vyp. 5, pp 18-20 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5V382)

Translation: It is experimentally shown that the distribution of rates of aging of quartz resonators conforms to a normal law.

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USSR

UDC: 621.372.412

GIL'VARG, B. A., LIVENSKIY, G. A.

"Concerning the Effect of Test Conditions on Aging of Quartz Resonators"

Elektron. tekhnika. Nauch.-tekhn. sb. Radiokomponenty (Electronic Technology. Scientific and Technical Collection. Radio Components), 1970, vyp. 5, pp 12-17 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6D353)

Translation: The paper presents the results of measurements of frequency departures of quartz resonators from time when they are subjected to high temperature and the maximum permissible excitation level. Resumé.

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USSR

UDC 615.472:615.846

LIVENSON, A. R., FRENK, A. A., KRETLOVA, Ye. L., and SOBOLEVSKIY, S. V.,  
All-Union Scientific Research Institute of Medical Instrument-Building, Moscow

"'Volna-2' Apparatus for Microwave Therapy"

Moscow, Meditsinskaya Tekhnika, No 4, Jul/Aug 72, pp 21-25

Abstract: In order to eliminate shortcomings of previous apparatus using electromagnetic waves for the treatment of patients, the Volna-2 apparatus was designed to use 65 cm wavelength. This makes it possible to penetrate human tissues twice as deep and to practically eliminate the standing waves in fat layers. The reflection coeff. scattering is also reduced by 1.8-fold. The portable apparatus generates electromagnetic waves of 460 MHz frequency, with a maximum output power of 100 watts. It consists of the wave autogenerator, wave power meter, interchangeable emitters, power supply unit, and automatics. Since it is impossible to measure the power absorbed by the patient's body, the measurement of the output power of the apparatus plays an important role in establishing the dosimetry for each patient. A duration of treatment combined with the apparatus output power makes it possible to find with sufficient accuracy the radiation dose received by the patient. The total error of the output power meter should not exceed  $\pm 25$  percent. A schematic diagram of the apparatus is given, with description of all details and materials used for its design.

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USSR

UDC 616.988.75-084.47 "1969"

BOBYLEVA, T. K., SLEPUSHKIN, A. N., RUSSINA, A. Ye., VITKINA, B. S., GRINEBERG, I. R., TARASOV, A. A., ~~LIVENCAND, N. I.~~, and ZHDANOV, V. M., Institute of Virology imeni Ivanovskiy, Academy of Sciences USSR, and Smolenskaya Oblast Sanitary Epidemiological Station

"Evaluation of the Efficacy of Mass Vaccinations Against Influenza" Report III  
Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii No 9, 1971, pp 18-23

Abstract: Double vaccination of approximately 50% of the population of the city of Smolensk with live influenza vaccine in 1968 proved to be effective in controlling the disease even during the 1969 epidemic caused by a new antigenic variant of type A influenza virus. Almost half as many contracted the disease as in the nearby cities of Vitebsk and Kaluga, where the population was not vaccinated -- 28.8, 54.3 and 48.7%, respectively. The difference between the adult sick rates was even greater -- 17.9, 38.1, and 41.2%, respectively. The side effects of the vaccine were minimal. The results of a similar mass vaccination program in Yartsevo were poor mainly because vaccine from the same strain had been used for three successive years and most of the people had become immune to it. Hence the vaccine strains should be changed periodically (once every 2 or 3 years).

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UDC 547.455  
KUDRYASHOV, L. I., LIVERTOVSKAYA, T. YA., VOZNESENSKAYA, S. V.,  
KOVALEV, YU. I., SHARPAIYY, V. A., and KOCHETKOV, N. K.

"Radiation Chemistry of Carbohydrates. XII. Effect of Structural  
Factors on Course of Radiolysis Processes of Aqueous Solutions of  
Methylglycosides"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 5, May 70, pp 1133-1137

**Abstract:** The authors studied regularities reflecting the relation-  
ship between the structure of the glycoside molecule and processes oc-  
curring during and after irradiation of aqueous solutions. The ob-  
jects of study chosen were  $\alpha$ -methyl-D-glucopyranoside,  $\beta$ -methyl-L-  
arabinopyranoside and  $\alpha$ -methyl-D-galactopyranoside. The radiation  
sources used were a Co-60 device and an electron accelerator for fro-  
zen solutions. The periodate oxidation method was used to determine  
the glycoside concentrations of the irradiated solutions. It was  
found that the stereochemistry of methylglycosides has a significant

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USSR

KUDRYASHOV, L. I., et al., Zhurnal Obshchey Khimii, Vol 40, No 5, May 70, pp 1133-1137

effect on their radiation resistance. There is practically no formation of free monosaccharides in the radiolysis of dilute aqueous solutions. The principal process in the radiolysis of  $\alpha$ -methyl-D-galactopyranoside and  $\beta$ -methyl-L-arabinopyranoside is the formation of deoxy sugars. According to EPR measurements, the composition and ratio of radiolysis products depend on the structure of the initial molecules and the reactivity of the intermediate particles that form.

2/2

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LIVKIN, G. I.

SPRS 59008

6.73

VII-4b. EFFECT OF GROWTH CONDITIONS AND GAS ETCHING ON THE CARRIER DISTRIBUTION IN THE GALLIUM ARSENIDE LAYERS

(Article by V. H. Zaitsev, G. I. Livkin, V. I. Yulyshev, Yu. G. Sidorenko, Novosibirsk, Itogi nauki i tekhnologii. Seriya fiziko-matematicheskie nauki, 1977, No. 1, p. 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000)

The methods of electric breakdown with respect to a plane junction and Hall measurements were used to investigate the effect of the carrier concentration on the properties of the epitaxial layers in the open chloride system on layers grown on high-resistance substrates were also investigated.

It was found that in the growth temperature range of 765 to 775°C the carrier concentration in the layers decreases with temperature. The dependence of the nature of the concentration distribution of the carriers in the epitaxial layers of gallium arsenide grown on a substrate alloyed with different admixtures was presented as a function of the crystallization temperature of the films.



USSR

UDC: 621.891: 662.75

BORODIN, A.YE., LIVINOV, A.A. and KOROLENKO, YU. I.

"Effect of Jet Fuels on Failure of Friction Surfaces of Second Kind"

Sb. nauch. tr. Kiev. in-t inzh. grazhd. aviatsii (Symposium of Scientific Works of Kiev Institute of Civil Aviation Engineers) 1971, vyp 2, pp 48-50 (from Referativnyy Zhurnal-Aviatsionnyye i Raketnyye Dvigateli, No 7, 1972, Abstract No 7.34.109)

Translation: The results of investigation of the effect of fuel mediums and of T-7 fuel volume temperature on the contact strength of SHKH15 steel are summarized. The test results show that the fuels being tested differ in their effects on pitting; the effect of T-7 fuel is the greatest, that of T-1 fuel the smallest. As to the temperature effect, the life of SHKH15 steel in T-7 fuel decreases with the increase of temperature to 60°C, increases with further increase of temperature (3 illustrations, 1 reference).

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Phytology

USSR

UDC 581.1.036

SAMYGIN, G. A., RAKITINA, Z. G., and LIVSHIN, A. Z., Institute of Plant Physiology imeni K. A. Timiryazev, USSR Academy of Sciences, Moscow

"The Resistance of Winter Wheat Tissue to Freezing and Drying in Unfavorable Gas Mixtures"

Moscow, Doklady Akademii Nauk SSSR, Vol 198, No 1, 1971, pp 224-227.

Abstract: To determine whether the formation of intracellular or extracellular ice is responsible for the increased deterioration of wheat frozen and dried in gas mixtures of a composition different from that of air, samples of regular and tempered winter wheat blades and sprouts were frozen and dried in atmospheres with various percentages of oxygen, nitrogen, and carbon dioxide. After thawing and rehydration, the blades were investigated microscopically and the sprouts were allowed to grow roots in a suitable medium. The results showed that increased concentrations of carbon dioxide and decreased

USSR

SANYGIN, G. A., RAKITINA, Z. G., and LIVSHIN, A. Z., Doklady Akademii Nauk SSSR, Vol 198, No 1, 1971, pp 224-227

concentrations of oxygen and of nitrogen raised the percentage of irreversibly destroyed cells to the same degree in samples which were frozen and in those which were dried. Since drying damages cells through withdrawal of intracellular water and formation of extracellular ice, it was concluded that unfavorable gas mixtures exert their detrimental effects during freezing of wheat by enhancing the withdrawal of intracellular water and the formation of extracellular ice.

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Acc. Nr: **AP0038115**

**L**

Ref. Code: UR 0326

PRIMARY SOURCE: Fiziologiya Rasteniy, 1970, Vol 17, Nr 1,  
pp 139-146

**WATER-RETAINING FORCES IN CELLS  
OF VARIOUS PLANTS IN CONNECTION WITH THEIR STABILITY WITH  
RESPECT TO DESSICATION AND FREEZING DURING FORMATION OF  
EXTRACELLULAR ICE**

**G. A. SAMOIN, A. Z. LYSHEIN**

*K. A. Timiriazev Institute of Plant Physiology, USSR Academy of Sciences, Moscow*

Variation of the water-retaining force in living or killed tissues was studied during removal of water from them by dessication and slow freezing. From the difference of these quantities in living and dead tissues the negative turgor in the cells was calculated. Negative turgor remained in cells containing such amounts of water which led to death of 50% of the cells. On further removal of water it continued to grow although it was not observed in preliminarily killed cells. It is shown that additional water-retaining forces are present in live cells which disappear when the water loss is sufficient to lethally affect the cells. Negative turgor in cells of various plants on the verge of death varies. It is from 2 to 6 times greater in onion scale and collard stem cells than in cells of the

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leaf parenchyma of wheat. This confirms the assumption made earlier that the main cause of cell death of the first two plants occurring on removal of water is the detrimental effect of mechanical forces on the protoplasm and in particular of negative turgor; the cause of death of leaf parenchyma cells is dehydration of the protoplasts.

19731168

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LIVSHIN, I.

CLARA

SO: JPRS 55933

04 MAY 1972

(Automatic Control Systems)

STRUCTURAL AND FUNCTIONAL PRINCIPLES OF AUTOMATIC CONSTRUCTION CONTROL SYSTEMS  
[Article by I. Livshin, Giprotsol; Moscow, Na Stroykakh Rossi, Moscow, No. 3, 1972, pp 15-17]

Note that 150 people participated in the work of the section on structural and functional principles of automatic construction control systems. Eighteen people participated in the debates. The majority of the speakers discussed the most complex and important problems of the creation of automatic construction control systems. Different points of view were expressed with respect to certain problems, and many problems were only mentioned along a deep and detailed discussion of them would probably have required that a special theoretical conference be called.

The necessity for sharp intensification of the work with respect to supplying the scientific-research, planning and design and construction organizations with procedural materials with respect to the development and introduction of ASUS was correctly noted in a number of reports. The interbranch and branch procedural and instructional materials on the development and introduction of automatic control systems published in recent years were written in too general form and do not answer many of the important specific problems of how to form the collective of workers, how correctly to select and state the documentation and materials to the conditions of the ASUS, how to adapt and so on. In addition, not only procedures and instructions are required, but also standard design documentation at all stages of the planning and design of ASUS.

The composition and structure of the planning documentation for the creation of ASUS was discussed in detail by V. Ovsyannikov (Scientific Construction Center of the Moscow Institute of Engineering Economics Imeni S. Ordzhonikidze), who noted that many ASUS designs suffer from wordiness, excessive descriptions and arguments. The planning documentation, in his opinion, must basically contain the document forms, the descriptions of the initial data files and the characteristics of the conversion of the files and documents by computer.

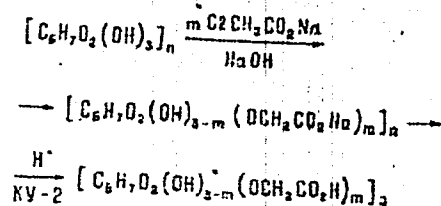
USSR

VASIL'YEV, A. Ye., and LIVSHITS, A. B., Central Order of Lenin Institute of Hematology and Blood Transfusion

"Synthesis of N-aminoacyl Derivatives of Carboxymethyldextran"

Riga, Fiziologicheski Opticheski Aktivnyy Polimernyye Veshchestva, "Zinatne," 1971, pp 170-174

Abstract: The authors suggested new methods for the N-aminoacylation of carboxymethyldextran (CMD) and O-aminoacylation of dextran, which can be used for linking medicinal substances to polysaccharides and to their derivatives by strong bonds to hydrolysis. This is considered a new approach to the synthesis of drugs with prolonged action and with predetermined circulation time in human blood. The synthesis of N-aminoacyl derivatives of CMD was carried out as follows:



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USSR

VASIL'YEV, A. Ye., and LIVSHITS, A. B., *Fiziologicheski i Opticheski Aktivnyye Polimernyye Veshchestva*, "Zinatne," 1971, pp 170-174

For the condensation of CMD with C protected amino acids two methods were used. Best results were obtained with carbodiimide acylation of CMD in water-pyridine system at 20°C for 48 hr. When the pyridine:water ratio was 3:2, all carboxyl groups in CMD were substituted with aminoester groups; and when the ratio was 3:1, the substitution did not exceed 15%. This type of substitution took place in the case of methyl ester of glycyl-CMD. Methyl ester of L-histidyl-CMD with 11.4% carboxyl group substitution and benzene ester of glycyl-CMD with different carboxyl groups substitution were synthesized by the same method. As opposed to methyl ester of N-aminoacyl-CMD, the benzene ester of N-glycyl-CMD was insoluble in water when all carboxyl groups were substituted. In the case of lower substitution, the compound was soluble in water but could not be precipitated in alcohol. A detailed description of all reactions is presented.

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USSR

UDO 621.52:533.59:541.183

KAPITANSKIY, V.R., LIVSHITS, A.I., METTER, I.M.

"Diffusion Of Hydrogen Through Palladium At Low Pressures And Evacuation Of Hydrogen Through A Palladium Partition In The System Of A Hydrogen Generator"

V sb. Materialy nauch.-tekhn. konf. Leningr. elektrotekhn. in-ta svyazi. Vyp. 4  
(Materials Of Scientific-Technical Conference Of Leningrad Electrical Engineering Institute Of Communications. Issue 4 -- Collection Of Works), Leningrad, 1971, pp 166-170 (from RZh:Elektronika i yeye primeneniye, No 4, April 1972, Abstract No 4A49)

Translation: At a temperature of  $520^{\circ}\text{C}$  and pressure of  $2 \cdot 10^{-5}$  mm of mercury, nonactivated palladium 0.3-mm thick gives an exhaust output of 0.1 l/sec per  $1\text{ cm}^2$  of the surface. The design of a nonactivated pump is described which gives an exhaust rate of  $\sim 3$  l/sec at a temperature of  $\sim 500^{\circ}\text{C}$  and a pressure of  $3 \cdot 10^{-4} \div 5 \cdot 10^{-5}$  mm of mercury. On the whole the pump spent  $\sim 500$  hours at the temperature range  $500\text{--}700^{\circ}\text{C}$ , during which all of its parameters remained unchanged. 6 ref. A.F.

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AA0040642

Livshits, A.L.

UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent, 1-70

241569 ELECTRO-MACHINE OF METALS by current pulses in a liquid medium containing carbon, according to the parent patent No. 196209, is improved by applying onto the working electrode, prior to the machining, a protective carbon-containing layer by pyrolysis of the liquid medium, which may be effected by heating the working surface of the electrode to 700-1000°C in an electric arc or furnace and, then, contacting it with the carbon-containing liquid medium. By this method, the durability of an electrode made e.g. of copper, is improved and the wearing of graphitized electrodes is reduced over the whole range of working conditions. The efficiency of the electrode is high.

30.3.64 as 891578/25-8 Add to 196209. A.L. LIVSHITS et alia. METAL-CUTTING MACHINES INST. et al. (28.8.69) Bul 14/18.4.69. Class 21h. Int.Cl.H 05b.

19750216

AA0040642

AUTHORS: Livshits, A. L.; Roze, L. V.; Zingerman, A. S.; Kravets,  
A. T.; Sosenko, A. B.; Aronov, A. I.; and Polotskiy, V. Ye.

Ekspperimental'nyy Nauchno - Issledovatel'skiy Institut  
Metallorazhishchikh Stankov i Zavod "V E F"

19750217

AA0040678

UR 0482

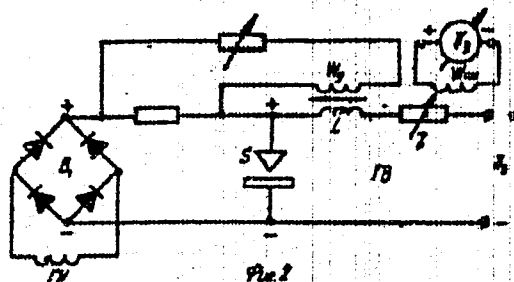
Soviet Inventions Illustrated / Section I Chemical, Derwent, 1-70

241570 ELECTRIC EROSION DEVICE for machining hard metals submerged in liquids was improved by providing an auxiliary generator to maintain a dynamic equilibrium during the breakdown and re-establishment of a protection layer of the machining electrode. The control elements of this generator are made in the form of an active or inductive and capacitive resistances and are connected in series with the rectifier current source. 18

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AUTHORS: Livshits, A. L.; Roze, L. V.; Zingerman, A. S.; Kravets,  
A. T.; Sosenko, A. B.; Aronov, A. I.; and Polotskiy,  
V. Ye. (Eksperimental'nyy Nauchno - Issledovatel'skiy  
Institut Metallorazhushchikh Stankov i Zavod "V E F")

19750284

AA0040678



30.3.64 as 891578/25-8. A.L.LIVSHITS et al. METAL  
CUTTING MACHINE TOOLS RES. INST. (8.9.69) Bul 14/18.  
4.69. Class 21h. Int. Cl. H 05b.

19750285

USSR

UDC 621.373.531

L  
LIVSHITS, A. L., ROGACHEV, I. S., OTTO, M. SH.

Generatovy impulsoy (Pulse Generators), Moscow, Energiya Press, 1970, 224 pp  
(from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9G243K)

Translation: A classification and description of the operating principles and methods of calculating strong current pulse generating systems used basically in electrophysical and to a lesser degree in electrochemical machine tools are presented. The book is designed for engineering-technical and scientific workers, graduate students and students dealing with the problems of strong current pulse engineering as applied to new methods of dimensional embossing.

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USSR

UDC: 519.2

LIVSHITS, A. N.

"Generatrices of Automorphisms With Finite Entropy"

Vestn. Leningr. un-ta (Leningrad University Herald), 1973, No 1, pp 32-36 (from RZh-Kibernetika, No 5, May 73, abstract No SV50 by the author)

Translation: W. Krieger proved that for every ergodic automorphism  $T$  with finite entropy  $h$  there exists a finite generatrix, and that the minimum number of elements of the generatrix is  $\Delta(T) \leq 2^h + 1$ . In this paper we offer another proof of the existence of a finite generatrix and of other results of Krieger. We also prove that  $\Delta(T) \leq 2^h + 2$ . This result is weaker than the analogous result of Krieger, but Krieger's proof is not entirely convincing.

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USSR

UDC 577.4

LIVSHITS, A. N., SERIKOV, YU. A.

"A Method of Synthesizing a Minimal Logical Network"

V sb. Ekon.-mat. metody i programmir. plan.-ekon. zadach (Mathematical Economic Methods and Programming Economic Planning Problems--collection of works), Moscow, 1972, pp 63-67 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V267)

Translation: The investigated synthesis technique is known in literature by the name of "sorting." Although the authors also obtained a series of interesting formulas, they did not succeed in introducing any thing significantly new into the classical version of sorting.

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USSR

UDC 621.789.620.186.1

LIVSHITS, B. G., ASTRAKHANTSEVA, N. A., IZGORODIN, A. K., NIKOLAYEVA, V. N.,  
(DECEASED), KHLONOV, V. S., and TSVILING, M. YA., Moscow Institute of Steel  
and Alloys

"Effect of Titanium on the Properties of the Beta- and Beta<sub>2</sub>-Phases and  
Brittleness of Annealed Alloys of the YuNDK35T5 Type"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 8, Aug 73,  
pp 37-40

Abstract: The effect of titanium on the brittleness of type YuNDK35T5 alloys  
in the equilibrium state at 770°C was studied, and hardness, chemical composi-  
tion of beta- and beta<sub>2</sub>-phases, and their effect on the failure process were  
determined. The four test samples contained (in wt %): 34-31 Fe, 15 Ni,  
8 Al, 35 Co, 4,5,6,7 Ti, and 4 Cu. The chemical composition of the phases is  
also given. Mechanical tests showed that as titanium content increases so does  
bend strength, percentage of cases of bending with cracks of the beta-phase,  
and percentage of cases of cessation of beta-phase precipitation, while decreases  
were noted for the number of secondary cracks in one sample, percentage of  
branch cracks, and beta-phase microhardness. The value of the critical tem-  
perature was determined for alloys YuNDK35T5 and YuNDK40T7 which has been  
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USSR

LIVSHITS, B. G., et al., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 8, Aug 73, pp 37-40

arc melted and annealed at 770°C for 2500 hours.  $T_{cr}$  was 680 and 700°C, respectively. The effect of the beta- and beta<sub>2</sub>-phases on alloy failure for the varying titanium content was explained in that in all the studied alloy samples a crack passes into the beta<sub>2</sub>-phase and bends the beta-phase precipitate. With increased Ti content, the attempt of cracks to bend beta-phase precipitates grows. In the alloy with 4% Ti, in 30 cases out of 100, cracks bend in their advancement of the beta-phase, and in the alloy with 7% Ti, in 65 cases out of 100. Crack cessation occurs, as a rule, in the beta-phase precipitations. This indicates that the beta-phase is less brittle than the beta<sub>2</sub>-phase and that with increased Ti content the beta-phase does a better job than the beta<sub>2</sub>-phase in hindering the advancement of a brittle crack. Three figures, two tables, five bibliographic references.

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Miscellaneous

USSR

UDC 620.186:669.018.58

LIVSHITS, B. G., IZGORODIN, A. K., NIKOLAYEVA, V. N., TSVILING, M. Ya. and KLYCHEVA, V. A., Moscow Institute of Steel and Alloys

"Study of the Kinetics of Gamma-Phase Formation in YuNDK35T5-Type Alloys at 830-900°C"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 6, 1972, pp 65-66

Abstract: The study was conducted on cast alloys quenched to a mono  $\beta_2$ -phase from 1240°C. The quenched specimens were put through low-temperature isothermal treatment at 900, 870, 850, 840, and 830°C. The holding times for each temperature were 15, 25, 45, 60, and 180 min, respectively. The specimens were cooled in open air. The amount and kinetics of the phase separation were determined in 50 fields of vision by Olagolev's method. Titanium is shown to promote intensive  $\gamma_1$ -phase separation (up to 950°C), which is undesirable from the viewpoint of low-temperature treatment. Microstructural analytical data indicate that the reduction of Al content from 5 to 7% intensifies  $\beta_2 \rightarrow \gamma_1 + \beta_2$  transformation at all test temperatures. Noteworthy is the fact that the reduction of Al content to 7% markedly affects the decomposition kinetics at 900-870°C but much less at 840 and 830°C. The results of the study have shown that low-temperature treatment of YuNDK35T5 alloys must be conducted at minimum temperatures and minimum possible hold times. An increase in Ti

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USSR

LIVSHITS, B. G., et al., Metallovedeniye i termicheskaya obrabotka metallov,  
No 6, 1972, pp 65-66

contents and a reduction of Al contents inhibit low-temperature treatment.  
(1 table, 8 bibliographic references)

2/2

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USSR

UDC 669.018.2-13-15:539.26

LIVSHITS, B. G., NIKOLAYEVA, V. N., TSVILING, M. Ya. and YAKOVLEV, A. P.,  
Moscow Institute of Steels and Alloys

"Structure of YuNDK35T5BA Alloy Following Hot Forming and Heat Treating"

Moscow, Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya,  
No 3, 1972, pp 132-134

Abstract: The purpose of this study was to find a way of hot forming  
YuNDK35T5BA alloy without disrupting its initial grain orientation < 100 >.  
The experiment involved specimens (with columnar crystals) of alloys of two  
compositions.

No. of Method of Alloy Melting		Co	Ni	Al	Cu	Ti	Nb	S	Ce	Fe
1	In vacuum	35.0	14.5	7.2	3.5	4.5	1.0	0.15	0.1	Remainder
2	In air	35.0	14.5	7.2	3.5	5.0	1.0	0.2	-	"

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USSR

LIVSHITS, B. G., et al., Izvestiya vysshikh uchebnykh zave eniy, Chernaya metallurgiya, No 3, 1972, pp 132-134

The microstructure of the specimens was examined following hot forming and heat treating at 810, 650, and 550°C. Both temperature and time specifications have been determined for the YND35T5BA alloy to effect a single-phase state. The initial orientation  $\langle 100 \rangle$  appears to be adequately retained after complete treatment for high coercivity. (3 illustrations)

USSR

UDC 539.67

1

KRIVONOGOV, G. S., MATVEYEV, V. V., ALEKSEYENKO, M. F., LIVSHITS, B. G.,  
and YAKOVLEV, A. P.

"Certain Regularities of Magnetic Hysteresis in Stainless Martensite Class Steels"

Sb. "Vnutrenneye treniye v metallicheskih materialakh" (Internal Friction in Metallic Materials), Moscow, Izd-vo "Nauka," 1970, pp 170-175

Abstract: The effect of temperature and static stresses on the magnitude of hysteresis losses in stainless steels of the martensite class, related mainly to the process of irreversible displacements of  $90^\circ$  domain walls, is studied.

Expressions are derived for the dependence of damping decrement on temperature, static stresses, and magnetomechanical hysteresis constants. The effect of various heat treatment conditions on magnetomechanical hysteresis is discussed. Good agreement was obtained between experimental and theoretical data. 4 figures, 5 references.

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USSR

UDC 539.67

VILLEMS, Kh. B., GLUSHCHETS, A. M., KEKALO, I. B., and LIVSHITS, B. G.

"Certain Magnetic and Magnetoelastic Relaxation Effects in Invar, Governed by Carbon Atom Diffusion"

Sb. "Vnutrenneye treniye v metallicheskih materialakh" (Internal Friction in Metallic Materials), Moscow, Izd-vo "Nauka", 1970, pp 182-187

Abstract: The temperature dependence of relaxed and nonrelaxed initial permeability is studied. It is shown that processes inducing a temporary drop in permeability take place in the 20-200°C temperature range. It is concluded from an analysis of data on the effect of elastic vibration amplitude on  $Q^{-1}$  in the carbon peak region (200°C) that two relaxation processes take place in invar. A mechanism on the onset of the relaxation process is presented. 4 figures, 14 references.

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Physical Properties

USSR

UDC 669.018.5:538.21

LIVSHITS, B. G., SUMIN, V. I., LILEYEV, A. S., and SHLYAPIN, A. D., Moscow  
Institute of Steel and Alloys

"The Effect of Cubic Crystalline Anisotropy on the Magnetic Properties of the  
YuNDK35T5 Alloy"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy -- Chernaya Metallurgiya, No  
11, 1970, pp 122-125

Abstract: Temperature dependences of the saturation magnetization coercivity, the constant of uniaxial anisotropy, and the constant of the cubic crystalline anisotropy were investigated on the YuNDK 35T5 alloy (35% Co; 13-14% Ni; 7.5% Al; 5% Ti; 3.5% Cu; the rest Fe) after isothermal treatment. A comparison of experimental and theoretical data led to the conclusion that other anisotropy types in the YuNDK35T5 alloy should be investigated. On the basis of the Stoner-Wohlfarth formula the angular dependences of the coercivity for a single-domain anisotropic-form particle with a cubic crystalline anisotropy were established. Cubic crystalline anisotropy was shown to have a considerable effect on the remagnetization mechanism of the alloy. It also explains the greatly increased coercivity in tempering.

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USSR

UDC 669.74':621.73.011

LIVSHITS, B. G., OKHRIMENKO, Ya. M., TYURIN, V. A., and MILYAYEV, I. M.,  
Moscow Institute of Steel and Alloys

"Deformation Characteristics of Low-Plasticity Manganese-Aluminum Alloys"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy -- Chernaya Metallurgiya,  
No 11, 1970, pp 126-129

Abstract: An experimental investigation was made of the temperature dependence of the plasticity of Mn-Al alloys (71% Mn; 29% Al) in dynamic and quasi-static compression, in the interval of 20-1100°C, and of the effect of the structural condition on strain hardening in the cyclic loading process. Experimental data are discussed by reference to diagrams showing the deformation stress during static upsetting at various temperatures and in relation to the compression degree in highly coercive and monotonic cyclic loading conditions. A sharp increase of plasticity was found in a low rate deformation at 550-850°C, which in this interval combines with phase transformations. An abnormal increase of the elastic modulus, the proportional limit, and the maximum compression stress takes place in a repeated loading after unloading the specimens in a highly coercive condition.

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172 017 UNCLASSIFIED PROCESSING DATE--090CT70  
TITLE--EFFECT OF SECOND ROLLING TEMPERATURE ON THE TEXTURE OF SILICON IRON  
DEFORMATION AND RECRYSTALLIZATION -U-  
AUTHOR--(03)--LIVSHITS, B.G., NOVIKOV, V.YU., KOSHKINA, L.A.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(2), 289-91

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--METAL TEXTURE, SILICON ALLOY, IRON ALLOY, METAL  
RECRYSTALLIZATION, METAL ROLLING, METAL DEFORMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1995/0191

STEP NO--UR/0048/70/034/002/0289/0291

CIRC ACCESSION NO--AP0115895

UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0115895

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTS OF THE CONDITIONS OF SECOND ROLLING (DEFORMATION RATIO AND TEMP.) ON THE DEFORMATION AND RECRYSTN. TEXTURE OF SI CONTG. IRON WAS STUDIED TO FIND RELATIONS GOVERNING THE RELATIVE AMTS. OF GRAINS WITH THEIR CUBIC PLANE COINCIDENT WITH THE ROLLING PLANE AND GRAINS ORIENTED AT ANGLES LESS THAN OR EQUAL TO 45DEGREES WITH RESPECT TO THE DIRECTION OF ROLLING. SHEET SPECIMENS 0.55, 0.7, AND 1.1 MM THICK ANNEALED AT 1130DEGREES AND EXHIBITING A GRAIN SIZE OF 1.8-2.3 MM AND A DEFINED, HOMOGENEOUS TEXTURE WERE ROLLED TO 0.35 MM (DEFORMATION RATIOS 36, 50, AND 68PERCENT) AT 20, 200, AND 300DEGREES. SUBSEQUENTLY THE SPECIMENS WERE VACUUM ANNEALED AT 670, 900, AND 1200DEGREES. THE DEFORMATION AND PRIMARY RECRYSTN. TEXTURES OF THE SURFACE LAYERS WERE STUDIED BY X RAYS AND THE TEXTURE OF SPECIMENS ANNEALED AT HIGH TEMPS. WAS EXAMD. METALLOGRAPHICALLY. THE TEXTURES ARE LISTED FOR EACH OF THE TREATMENT VARIANTS. THE TEXTURE OF COLD ROLLED AND SUBSEQUENTLY ANNEALED SPECIMENS SHOWED A COMPONENT WITH THE (100) PLANE AND (011) ORIENTATION, DEVIATING CONSIDERABLY (BY AN ANGLE LARGER THAN 20DEGREES) FROM THE DIRECTION OF ROLLING. THE CONTENT OF THIS COMPONENT WAS REDUCED FROM 30 TO 2PERCENT UPON INCREASING THE DEFORMATION RATIO FROM 36 TO 68PERCENT, AND WAS NEGLIGIBLE IN SPECIMENS ROLLED AT ELEVATED TEMPS. FACILITY: MOSK. INST. STALI SPLAVOV, MOSCOW, USSR.

UNCLASSIFIED

1/2 020 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--EFFECT OF LOW TEMPERATURE ANNEALING ON THE TEXTURE OF THE PRIMARY  
RECRYSTALLIZATION OF A SINGLE CRYSTAL OF SILICIDED IRON -U-  
AUTHOR--(03)-LIVSHITS, B.G., NOVIKOV, V.YU., ROSHCHINA, L.Y.  
COUNTRY OF INFO--USSR L  
SOURCE--IZV. AKAU. NAUK SSSR, SER. FIZ. 1970, 34(2), 249-54  
DATE PUBLISHED--70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--METAL TEXTURE, METAL SINGLE CRYSTAL, IRON, SILICIDE,  
ANNEALING, METAL RECRYSTALLIZATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1995/0188 STEP NO--UR/0048/70/034/002/0249/0254  
CIRC ACCESSION NO--AP0115892  
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--09OCT7C

CIRC ACCESSION NO--AP0115892

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY USING X RAY AND METALLOGRAPHIC METHODS IT WAS SHOWN THAT IN A COLD ROLLED SILICIDED FE SINGLE CRYSTAL (110) (001) THE RECRYSTN. NUCLEI APPEAR 1ST ON THE NEUMANN BANDS AND THEREAFTER ON THE STRAIN BAND BOUNDARIES. THE LATTER HAVE A FASTER GROWTH RATE. THE ORIENTATION OF THE GRAINS APPEARING ON THE NEUMANN BANDS IS (320) (001), (210) (001), AND (310) (001), ON THE STRAIN BAND BOUNDARIES MAINLY (110) (001); INSIDE THE STRAIN BANDS (111) (112) AND (320) (001), AND (210) (001). ANNEALING AT 450DEGREES FOR 13 MIN BEFORE THE PRIMARY RECRYSTN. SLOWS DOWN THE GROWTH OF THE (110) (001) GRAINS. THIS LEADS TO A DECREASE OF THIS COMPONENT IN THE RECRYSTN. TEXTURE AND THE COMPONENTS (320) (001), (210) (001), AND (310) (001) ARE STRONGLY ENHANCED. FACILITY: MOSK. INST. STALI SPLAVOV, MOSCOW, USSR.

UNCLASSIFIED

Physical Properties

USSR

UDC: 669.01.018.5:689.764:535.21

DEMENT'YEVA, G.P., LIVSHITS, B.G., LIVSHITS, L.B., and MELAYEV, I.M., Moscow  
Institute of Steel and Alloys

"Magnetic Properties of Cast Hard-Magnetic Alloys in the System Manganese --  
Aluminum -- Carbon"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 5, 1970,  
pp 120-122

Abstract: Studies were made to determine the technological possibilities and prospects of Mn -- Al -- C cast alloys as permanent-magnet materials to compete with alloys containing nickel and cobalt. In the experiments, the alloy (chemical analysis: 71.3% Mn, 28.2% Al, 0.99% C) was melted in a 5-kg induction furnace in an argon atmosphere (in an alumina crucible) and poured into 13-15-mm-diameter quartz tubes 150-180 mm in length. Brand MRO manganese, brand AVCOB aluminum, and carbon in the form of graphite were used for the melt. All specimens were homogenized at a temperature of 1100°C for one hour. According to the curves of magnetic property changes after normalization from 1100°C and tempering, it was determined that the maximal magnetic properties are obtained after a 15-minute holding time at a tempering temperature of 650°C. Carbon, in addition to improving the magnetic properties, increases the hardness and brittleness of Mn -- Al alloys and promotes directional crystallization. On the basis of the results obtained, it was postu-  
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USSR

DEMENT'YEVA, G.P., et al, Izvestiya Vysshikh Uchebnykh Zavedaniy, Chernaya Metallurgiya, No 5, 1970, pp 120-122

lated that the cast Mn -- Al -- C alloy could replace certain Fe -- Ni -- Al cast alloys containing up to 30% Ni. However, additional measures will be required to lower the susceptibility of the Mn -- Al -- C alloy to crack formation in heat treatment.

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USSR

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LIVSHITS, B. G., IZGORODIN, A. K., NIKOLAYEVA, V. N., and TSVILINS, M. YA.

"The Effect of Titanium on the Plasticity and Nature of Fracture of YuNDK35T5-Type Alloys"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 7,  
1970, pp 116-119

Abstract: This article contains an investigation of YuNDK35T5-type alloys with 4, 5, 6, and 7% Ti. The microthermal emf and microhardness of the alloys were measured in the highly coercive state in order to determine the effect of titanium on liquation. The static transverse strength and elastic-plastic bending deflection were determined. Interferometric, fractographic, and microstructural studies were made of the fractured samples. Increasing the titanium content from 4 to 7% increased the degree of liquation in the alloy and the plasticity with respect to the grain body. Increasing the titanium content in YuNDK35T5-type alloys to 7% is expedient for simultaneous development of a method of improving the boundary state. An equation is derived for  $\sigma$  as a function of the titanium content in the form of a regression line.

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1/2 051 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--ULTRASONIC OSCILLATIONS OF THE RADIATION INTENSITY OF TRAVELING  
MEDIUM LASERS -U-  
AUTHOR--(02)-LIVSHITS, B.L., TURSUNOV, A.T.  
COUNTRY OF INFO--USSR  
SOURCE--AKADEMIIA NAUK SSSR, DOKLADY, VOL 190, FEB. 1, 1970, P 813, 814  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--SOLID STATE CASER, LASER MODULATION, ELASTIC DEFORMATION,  
ULTRASONIC VIBRATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1984/0268 STEP NO--UR/0020/70/190/000/0813/0814  
CIPC ACCESSION NO--AT0055064  
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--16OCT70

2/2 051

CIRC ACCESSION NO--AT0055064

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. STUDY OF A LOW FREQUENCY MODULATION EFFECT NOTED IN SOLID STATE TRAVELING MEDIUM LASERS AND ATTRIBUTED TO THE ELASTIC PROPERTIES OF THE ACTIVE MEDIUM. IT IS CONFIRMED THAT THE ULTRASONIC MODULATION OF THE RADIATION INTENSITY OF TRAVELING MEDIUM LASERS IS REALLY CAUSED BY LONGITUDINAL VIBRATIONS OF THE SOLID STATE ACTIVE LASER MEDIUM. IT IS ESTABLISHED THAT THIS MODULATION IS CAUSED BY ELASTIC VIBRATIONS OF THE LASER RODS RESULTING FROM A CHANGE IN THE LENGTH OF THE RODS. FACILITY: AKADEMIIA NAUK SSSR, INSTITUT OBSHCHEI I NEORGANICHESKOI KHIMII, MOSCOW, USSR.

UNCLASSIFIED

1/2 013 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--COOPERATION BETWEEN THE SCIENTIFIC AND TECHNICAL LIBRARY OF THE  
STATE DESIGN OFFICE FOR MACHINE BUILDING TECHNOLOGIES -U-  
AUTHOR--LIVSHITS, E.G.

COUNTRY OF INFO--USSR

SOURCE--NAUCHN. I TEKHN. BIB-KI SSSR, NR 9 (81), PP. 32  
REFERENCE--REF. ZH. INFORMATICS, MOSCOW, 1970, NR 3  
DATE PUBLISHED-----70

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--PATENT, LIBRARY, MACHINE INDUSTRY, INFORMATION PROCESSING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAHE--1999/0470

STEP NO--UR/0667/70/000/009/0032/0032

CIRC ACCESSION NO--AR0122636

UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AR0122636

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. COOPERATION BETWEEN THE SCIENTIFIC AND TECHNICAL LIBRARY OF THE STATE DESIGN OFFICE FOR MACHINE BUILDING TECHNOLOGIES OF TASHKENT AND THE OFFICE'S PATENT INFORMATION DIVISION IS REPORTED. THE MAJOR LINES OF COOPERATION INCLUDE: ORGANIZATION OF REFERENCE LIBRARY; SCIENTIFIC PROCESSING OF THE COLLECTIONS; MAINTENANCE OF THE REFERENCE FILE AND SPECIAL FILES; PUBLICATION OF A NEW ACQUISITIONS BULLETIN; ARRANGEMENT OF FREE ACCESS DISPLAYS OF LITERATURE, ETC.

UNCLASSIFIED

C. Application of Theoretical Probability  
and Statistical Methods

USSR

UDC: 519.2

KISLOV, A. M., LIVSHITS, E. M.

"Comparing the Effectiveness of Two Statistical Modeling Schemes  
in Transport Problems"

Khar'kov, Vychisl. mat. i vychisl. tekhn.--sbornik (Computational Mathematics and Computer Technology--collection of works), vyp. 3, 1972, pp 97-102 (from RZh-Kibernetika, No 5, May 73, abstract No 5V250 by the authors)

Translation: The paper deals with the question of using a Monte-Carlo method to calculate the probability that a particle will reach a predetermined position in some simple physical systems when schemes of direct modeling of trajectories and modeling with weights are used. Theoretical estimates of the effectiveness of the given modeling schemes are established for these systems, and a comparison is made of effectiveness with different geometric and physical parameters of the system.

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USSR

LIVSHITS, E. M., RUBLINETSKIY, V. I.

"Optimal Subdivision of an Ordered Set into Intervals"

Vychisl. Mat. i Vychisl. Tekhn. [Computer Mathematics and Computer Technology -- Collection of Works], No 3, Khar'kov, 1972, pp 86-89 (Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V530, by the authors).

Translation: The class of problems in which a functional is minimized in all possible subdivisions of an ordered set into intervals is reduced to determination of the shortest path in a network. A method is presented for determining the shortest path in the network with a fixed number of lines, allowing the problem of the optimal subdivision into a fixed number of intervals to be solved.

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USSR

UDC: 531.862

RUSINOV, M. M., IVANOV, P. D., POPOV, L. Ye., LIVSHITS, E. M., GOL'DBERG, G. R., KUDRYASHOV, A. M., Leningrad Institute of Precision Mechanics and Optics

"A Sighting Tube for Observing Objects in an Aqueous Medium"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzsy, Tovarnyye Znaki, No 6, Feb 72, Author's Certificate No 328410, Division G, filed 16 Sep 70, published 2 Feb 72, p 143

Translation: This Author's Certificate introduces: 1. A sighting tube for observing objects in an aqueous medium which contains two objective lenses with protective glasses, collective lenses and erecting systems. The tube also contains a commutating flip mirror and an ocular. As a distinguishing feature of the patent, the tube is designed for simultaneous use of the visual optical system and photography of the field of view of the objective lenses. Placed directly in front of the photosensitive film is a three-component system of single positive menisci with concavity facing the object. The three-component system is introduced into the beam path by an auxiliary beam-splitting flip mirror. 2. A

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USSR

RUSINOV, M. M. et al., USSR Author's Certificate No 328410

modification of this tube distinguished by the fact that provision is made for compensating for rotation of the image and correcting for chromatic aberrations. Placed in front of the ocular is a PK-Q<sup>b</sup> prism and a plane-parallel plate with chromatic radius.

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LIVSHITS, E. Ya. 2

UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

2/70

243040 CONTACTLESS SYNCHRONOUS GENERATOR WITH COMBINED EXCITATION

achieves higher specific power capability. Its components are: permanent magnet (1) with pole-piece (4); inductor system comprising exciter winding (7), cylindrical poles (2,3), star-shaped rotor poles (5,6); stator (8), non-magnetic shaft (9), six-sided bushing (10), hubs (11,12) for inductor rotor. The magnetic system is arranged so that cylindrical poles (2) join pole-pieces (4) of one polarity and poles (3) of the other system join pole-pieces of other polarity. In order to reduce the permeance between the six-sided bushing (10) and inductor rotor hubs (11,12), the hubs are axially removed and the star-shaped poles are slanted.

18.7.67 as 1173847/24-7. V.G.ANDREEV et al. (25.9.69)

Bul 16/5.5.69. Class 21d<sup>2</sup>. Int.Cl. H 02k.

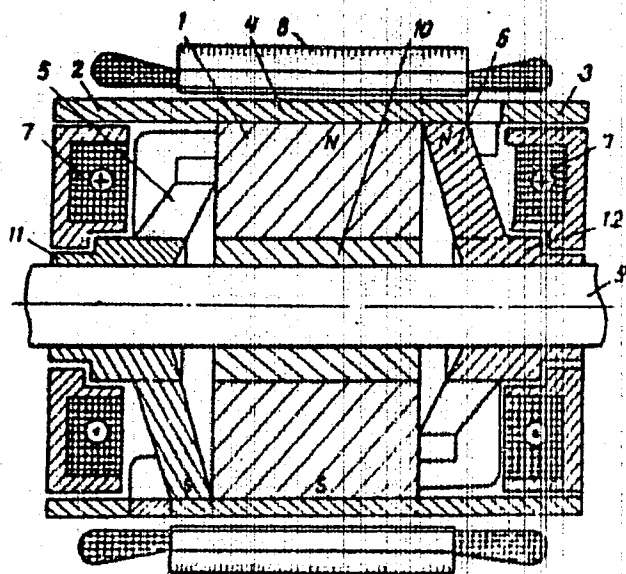
AUTHORS: Andreev, V. G., Golgofskiy, F. I., Kuks, V. Ya.,  
Livshits, E. Ya., Starostin, A. P.

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*[Handwritten signature]*

1/2 024 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--X RADIATION AND RADIO EMISSION OF LOCAL SOLAR SOURCES -U-  
AUTHOR--(03)-GELFREYKH, G.B., ZHITNIK, I.A., LIVSHITS, H.A. L 2  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, ASTRONOMICHESKIY ZHURNAL, VOL 47, NO 2, 1970, PP 329-339  
DATE PUBLISHED-----70  
SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS  
TOPIC TAGS--X RADIATION, RADIO EMISSION, SUNSPOT, HELIOGRAM, RADIO  
TELESCOPE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--2000/1399 STEP NO--UR/0033/70/047/002/0329/0339  
CIRC ACCESSION NO--AP0125044  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0125044

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EMISSION OF SOURCES OVER THREE SPOT GROUPS IN THE X REGION AND CENTIMETER RADIO EMISSION RANGE DURING THE PERIOD 16-30 JUNE 1967 IS COMPARED. X RAY HELIOGRAMS WITH A RESOLUTION OF SIMILAR TO 3 PRIME IN THE REGIONS 8-14 AND 6-10 A WERE OBTAINED FROM THE SATELLITE "KOSMOS 166". THE SPECTRA OF THESE SAME SOURCES IN THE CENTINETER RANGE WERE OBTAINED FROM OBSERVATIONS WITH THE LARGE PULKOVO RADIO TELESCOPE WITH A RESOLUTION OF 1-3 PRIME. IT WAS ESTABLISHED THAT THE RELATIONSHIP BETWEEN THE DEVELOPMENT OF SPOT GROUPS, X RADIATION AND RADIO EMISSION IS EXTREMELY COMPLEX: IN ADDITION TO SIMULTANEOUS VARIATIONS THERE WAS A CASE OF DECREASE IN X AND RADIO EMISSION WITHOUT ANY CHANGES IN THE SPOT GROUP; IN ONE CASE THE RESTORATION OF RADIO EMISSION FLUKES WAS NOT ACCOMPANIED BY ANY CHANGE IN X RADIATION. IN THE FORMATION OF A NEW GROUP THE RADIO SOURCE DEVELOPED APPROXIMATELY A DAY AFTER THE APPEARANCE OF CONSIDERABLE X RADIATION. IT IS DEMONSTRATED WITHIN THE FRAMEWORK OF THE BREMSSTRAHLUNG MECHANISM AT SHORT WAVELENGTHS  $\lambda$  EQUALS 2-3.2 CM (AND NOT AT  $\lambda$  SIMILAR TO 10 CM, AS ASSUMED BEFORE), THAT RADIO OBSERVATIONS LIMIT THE EMISSION MEASURE TO INTEGRAL OF N SUBE PRIME2 DV IS SMALLER THAN OR SIMILAR TO 3 TIMES 10 PRIME48 CM PRIME NEGATIVE3, WHEREAS X RADIATION OBSERVATIONS INDICATE INTEGRAL OF N SUBE PRIME2 DV IS SIMILAR TO 3 TIMES 10 PRIME49 CM PRIME NEGATIVE3 AND T IS SIMILAR TO 2 TIMES 10 PRIME6K. FACILITY: MAIN ASTRONOMICAL OBSERVATORY ACADEMY OF SCIENCES USSR. FACILITY: PHYSICS INSTITUTE AND INSTITUTE OF TERRESTRIAL MAGNETISM. FACILITY: IONOSPHERE AND RADIO WAVE PROPAGATION.

UNCLASSIFIED

Acc. Nr.: AP0044042

RisE. Code: UR0031  
JPRS 50162

Light Scattering in the Earth's Atmosphere

(Complete translation: "Problems in Light Scattering in the Earth's Atmosphere," by G. Sh. Lixvits; Alma-Ata, Vestnik Akademii Nauk Kazakhskoy SSR, 1(297), 1970, pp 62-63)

An All-Union Conference on Light Scattering in the Atmosphere was held in Alma-Ata. It was sponsored by the Radiation Commission of the Interdepartmental Committee under the Presidium Academy of Sciences USSR and the Atmospheric Optics Section of the Astrophysical Institute Academy of Sciences Kazakh SSR.

The conference was attended by about 100 persons, of whom 70 represented scientific institutions in Moscow, Leningrad, Tomsk, Minsk and other cities in the country. More than 100 reports were presented; these were devoted to a very wide range of problems associated with light scattering in the earth's atmosphere.

A distinguishing feature of the conference was the presence of specialists in different fields of knowledge: geophysicists, oceanologists, astronomers and biophysicists.

Much interest was shown in reports presented at the plenary sessions. Original methods for investigating the structure and composition of the

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atmosphere on the basis of twilight measurements and from measurements of the brightness of artificial earth satellites during their entry into the earth's shadow were discussed in a report by Academician V. G. Fesenkov. A report by K. S. Shifrin (Leningrad) was devoted to discussion of new investigations of the most active atmospheric component, aerosol, and methods for solving the inverse problem, determination of the spectrum of aerosol particle sizes on the basis of optical measurements.

A broad range of problems relating to atmospheric sounding using the latest methods and lasers was examined in a report by V. Ye. Zuyev (Tomsk). A report by G. Sh. Livshits (Alma-Ata) was a review of investigations; it gave the results of solution of direct and some inverse problems and examined the further prospects for research.

Generalizing reports were also presented at the section meetings. A. P. Ivanov (Minsk) reported on investigations of light scattering (in particular, on the light of coherent sources) made in Belorussia. T. P. Toropova (Alma-Ata) gave a report on investigations in the surface layer of the atmosphere and determination of some optical parameters of aerosol. O. M. Pokrovskiy and Yu. M. Timofeyev (Moscow) presented a brief review of modern methods for solving incorrect problems, in particular, some problems in transfer theory.

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In the first section, "Theory of Radiation Transfer in the Atmosphere," 19 reports were presented, most of them devoted to methods for computing the field of scattered radiation (T. A. Germogenova, L. I. Koprova, M. S. Malkevich, T. A. Sushkevich, D. I. Naringer, O. I. Smoktiy, V. V. Badayev), especially the Monte Carlo method (G. I. Marchuk, G. A. Mikhaylov, M. A. Nazaraliyev, R. A. Darbinyan, B. M. Golubitskiy, M. V. Tantashev and T. Zhad'ko). A considerable place was devoted to approximate solutions (S. D. Gutshabash, E. P. Zege, I. L. Katsev, S. A. Makarevich, O. V. Bushmakova) and to analytical and qualitative solutions (A. A. Dmitriyev, R. G. Indzhgia, M. G. Kuzmina, A. K. Kolesov and O. I. Smoktiy).

The second section, "Light Scattering by Atmospheric Aerosols," heard 27 reports which covered a wide variety of problems in the physics of aerosols. A large number of reports dealt with the inverse problem, determination of the aerosol spectrum from optical measurements (K. S. Shifrin, V. A. Punina, A. Ye. Perel'man, V. I. Kompanovskiy, N. I. Nikitinskaya, L. S. Ivlev, Ye. L. Yanchenko, N. K. Spatakina, V. I. Domkhovskiy, V. I. Bukhratyy and S. S. Khmelevtsev) and investigations of polydisperse media (L. L. Alekhina, S. O. Obasheva, T. P. Toropova), including in the infrared spectral range (V. R. Belov, G. M. Krekov, M. M. Krekova). A number of studies gave the results of studies of incoherent scattering of the light disperse phase (G. V. Rozenberg, Yu. R. Ozorovich), statistical

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characteristics of aerosol (Yu. S. Georgiyevskiy, L. I. Koprova, G. L. Shubova, N. D. Rozhkovskaya), cooperative effects (A. P. Ivanov, A. Ya. Khayrullina, Ye. A. Vedernikov, M. V. Kabanov), dispersion of the medium (Ye. K. Naumenko, A. P. Prishivalo) and other properties of the aerosol medium. A series of reports dealt with investigations of the vertical profiles of aerosols and gave the results of aircraft measurements (L. S. Ivlev, N. I. Burangulov, I. Ya. Badinov, V. B. Lipotov, V. I. Domkhovskiy, V. M. Orlov, G. M. Petelin). A considerable place was devoted to laboratory investigations of different aerosol properties: pure absorption (V. N. Glushko, G. Sh. Livshits, V. A. Molchanov, B. T. Tashenov), absorption in suspensions (R. Ya. Sid'ko, N. S. Nemchenko, V. A. Yeroshin, V. A. Zakharova), scattering functions (T. P. Toropova). Two reports contained information on the stability of the aerosol atmosphere according to data obtained by observations of circumsolar aureoles (V. N. Golikov).

The third section, "Light Scattering in the Atmospheric Surface Layer" (16 reports) was devoted to various problems in the transfer and propagation of radiation near the earth's surface and optical properties of the surface layer. A number of papers reported on investigation of aerosol scattering functions (T. P. Toropova, K. M. Salamakhin, N. M. Ibrahimov, Yu. S. Lyubovtseva, V. A. Donchenko, M. V. Kabanov, I. V. Samokhvalov), in particular, on measurement of the polarization characteristics

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of scattered light (V. A. Donchenko, I. V. Samokhvalov, I. F. Kelistratov, I. M. Levin, T. N. Lomonosova); a particular place was given to the problem of the "forward" scattering of light and its "backward" scattering (at a scattering angle of  $180^\circ$ ).

Much attention was given to investigations of fluctuations of the light field (A. Ya. Khayrullina, A. G. Borovoy, Yu. K. Postoyev, V. D. Savchenko, S. S. Khmelevtsev, A. F. Zhukov) and problems associated with the propagation of laser radiation and nonstationary scattering (A. P. Ivanov, A. L. Shrelin, G. M. Krekov, B. A. Kargin, I. I. Kalinin, I. D. Sherbaf). Two reports gave the results of study of atmospheric extinction in the IR region of the spectrum (M. V. Kabanov, Yu. A. Pkhalugov, V. L. Filipov, S. O. Mirumyants, L. M. Artem'yeva).

The fourth section, "Light Scattering in Clouds," was represented by 12 reports which reflected both theoretical and experimental investigations of the earth's cloud cover. Many of the reports gave the results of investigations of reflection, transmission (V. S. Malkova, L. M. Romanova, B. A. Kargin, L. D. Krasnokutskaya, G. M. Krekov, Ye. M. Feygul'son, O. I. Popov, I. S. Reshetnikova, Ye. O. Fedorova, V. Ya. Galin, B. N. Denchik, M. V. Kabanov, B. A. Savel'yev) and absorption of light in clouds (V. I. Dianov-Klokov, Ye. P. Kropotkina, I. P. Malkov, O. A. Matveyeva, I. A. Palitsina, Ye. V. Fokeyeva, G. A. Kiriyyenko). A number of reports were

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devoted to study of the physical characteristics of clouds as a scattering medium: their scattering functions (B. A. Savel'yev, V. Ya. Fadeyev), scattering and transparency coefficients (R. T. Timanovskaya, Ye. M. Feygel'son and I. V. Samokhvalov), and the dependence of the complex indices of refraction of cloud droplets on temperature (V. Ye. Zuyev, P. N. Kokhanenko and V. K. Sonchik).

The fifth section, "Light Scattering in a Cloudless Atmosphere (Daytime Sky and Twilight)," dealt with studies of the intensity and polarization of scattered light in the presence of a cloud cover. Among the 23 reports in this section a considerable number were devoted to direct measurements and computations of sky brightness in the visible (G. Sh. Livshits, I. A. Fedulin, A. I. Ivanov, B. T. Tashenov, E. L. Tem, L. M. Musorina, G. S. Isayev, Ye. Ye. Artemkin), UV (V. Ye. Pavlov, G. A. Studenina, Ya. A. Teyfel') and IR regions of the spectrum (Ye. O. Fedorova, Ye. D. Sholokhova, G. I. Lobanova, V. S. Bortkevich, O. V. Pershina, O. G. Kuznechik, G. K. Afanas'yev, Ye. Ye. Artemkin, V. I. Kushpil', L. F. Petrova, K. F. Khazak). A number of studies contained the results of polarization measurements of the daytime sky (G. Sh. Livshits, L. M. Musorina, E. L. Tem, V. Ye. Pavlov, G. A. Studenina, Ya. A. Teyfel'), used, in particular, for solving the inverse problem, determining terrain

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albedo (A. I. Ivanov, G. Sh. Livshits, E. L. Tem). Individual studies dealt with the role of the aerosol component (O. D. Barteneva, N. I. Nikitinskaya, Ye. A. Polyakova) and its effect on sky brightness and polarization (A. I. Ivanov, B. T. Tashenov, E. L. Tem) and also the possible role of incoherent scattering in luminescence of the daytime sky (N. N. Grachev, V. I. Dianov-Klokov).

The conferees heard with interest a report by specialists at Leningrad State University made in collaboration with cosmonauts; it dealt with interesting investigations of the twilight auricle of the earth's atmosphere from the "Soyuz-5" spaceship (B. V. Volynov, A. P. Gal'tsev, K. Ya. Kondrat'yev, O. I. Smoktiy, Ye. V. Khrunov).

The conferees were familiarized with the Astrophysical Observatory of the Academy of Sciences Kazakh SSR, instruments and equipment of the atmospheric optics section and work done and planned. As a result of contacts with specialists in other institutions the atmospheric optics section has concluded an agreement on the making of joint studies with them.

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1/4 039 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--ALL UNION CONFERENCE ON ATMOSPHERIC LIGHT SCATTERING -U-  
AUTHOR--LIVSHITS, G.SH.  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, IZVESTIYA AKADEMII NAUK SSSR, FIZIKA ATMOSFERY I OKEANA,  
VOL VI, NO. 5, 1970, PP 541-543  
DATE PUBLISHED-----70  
SUBJECT AREAS--ATMOSPHERIC SCIENCES, BEHAVIORAL AND SOCIAL SCIENCES  
TOPIC TAGS--CONFERENCE, ATMOSPHERIC OPTICS, LIGHT SCATTERING, ATMOSPHERIC  
RADIATION, MONTE CARLO METHOD, VERTICAL PROFILE, INVERSE PROBLEM,  
AEROSOL  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3005/0486 STEP NO--UR/0362/70/006/005/0541/0543  
CIRC ACCESSION NO--AP0132701  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0132701

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN ALL UNION CONFERENCE ON ATMOSPHERIC LIGHT SCATTERING, CALLED BY THE RADIATION COMMISSION OF THE METEOROLOGY AND ATMOSPHERIC PHYSICS SECTION OF THE INTERDEPARTMENTAL GEOPHYSICAL COMMITTEE, WAS HELD AT THE ASTROPHYSICAL INSTITUTE ACADEMY OF SCIENCES KAZAKH SSR AT ALMA ATA DURING THE PERIOD 10-16 NOVEMBER 1969. THE CONFERENCE WAS ATTENDED BY 100 PERSONS. MORE THAN 100 REPORTS WERE PRESENTED; THESE WERE DEVOTED TO VARIOUS PROBLEMS RELATED TO LIGHT SCATTERING IN THE EARTH'S ATMOSPHERE. PARTICIPANTS INCLUDED GEOPHYSICISTS, OCEANOLOGISTS, ASTRONOMERS AND BIOPHYSICISTS. THE REPORT CITED BELOW IS IN GENERAL LIMITED TO THE NAMES OF THE AUTHORS AND THE GENERAL CONTENT OF THEIR COMMUNICATIONS. THE FIRST SECTION WAS ON THE "THEORY OF RADIATION TRANSFER IN THE ATMOSPHERE (CHAIRMAN M. V. MASLENNIKOV, 19 REPORTS). MOST PAPERS DEALT WITH METHODS FOR COMPUTING THE FIELD OF SCATTERED RADIATION. THE MONTE CARLO METHOD HAS BEEN USED IN SOLVING THE MODEL INVERSE PROBLEM RELATIVE TO THE VERTICAL PROFILE OF THE COEFFICIENTS OF AEROSOL SCATTERING FOR A SPHERICAL ATMOSPHERE. COMPUTATIONS HAVE BEEN MADE OF THE REFLECTION OF STATIONARY AND NONSTATIONARY RADIATION FROM A SEMIINFINITE MEDIUM. OTHER REPORTS DEALT WITH APPROXIMATE, ANALYTICAL AND QUALITATIVE SOLUTIONS. ONE REPORT DEALT WITH THE RELATIONSHIP BETWEEN THE FUNDAMENTAL CONCEPTS OF TRANSFER THEORY AND THE THEORETICAL INFORMATION CONCEPT OF ENTROPY. THE SECOND SECTION (CHAIRMAN K. S. SHIFRIN, 27 REPORTS) WAS ON "LIGHT SCATTERING BY AN ATMOSPHERIC AEROSOL".

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PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0132701

ABSTRACT/EXTRACT--MANY REPORTS DEALT WITH SOLUTION OF THE INVERSE PROBLEM IN SCATTERING THEORY, DETERMINATION OF THE AEROSOL SPECTRUM FROM OPTICAL MEASUREMENTS. REPORTS WERE GIVEN ON POLYDISPERSE MEDIA, INCLUDING IN THE IR REGION. SOME REPORTS GAVE THE RESULTS OF INVESTIGATIONS OF THE STATISTICAL CHARACTERISTICS OF AEROSOL AND ITS EFFECT ON THE FORM OF THE SCATTERING INDICATRIX. THE EFFECT OF EDGE EFFECTS ON INCOHERENT LIGHT SCATTERING WAS EXAMINED, AS WERE EXPERIMENTAL STUDIES OF COOPERATIVE EFFECTS. OTHER REPORTS DEALT WITH STUDY OF THE VERTICAL PROFILES OF AEROSOL, AIRCRAFT MEASUREMENTS, LABORATORY STUDIES OF VARIOUS PROPERTIES OF AEROSOLS: PURE ABSORPTION, ABSORPTION IN SUSPENSIONS AND SCATTERING FUNCTIONS. THE THIRD SECTION WAS ON "LIGHT SCATTERING IN THE ATMOSPHERIC SURFACE LAYER (CHAIRMAN V. YE. ZUYEV, 16 REPORTS), DEVOTED TO TRANSFER AND PROPAGATION OF RADIATION NEAR THE EARTH'S SURFACE. THESE INCLUDED AEROSOL SCATTERING FUNCTION STUDIES AND PAPERS ON MEASURING THE POLARIZATION CHARACTERISTICS OF SCATTERED LIGHT. OTHER PAPERS DEALT WITH PROPAGATION OF THE RADIATION OF LASERS AND NONSTATIONARY SCATTERING AND ATMOSPHERIC TRANSPARENCY IN THE IR REGION. THE FOURTH SECTION WAS "LIGHT SCATTERING IN CLOUDS (CHAIRMAN A. P. IVANOV, 12 REPORTS). IT DEALT WITH BOTH EXPERIMENTAL AND THEORETICAL STUDIES OF THE EARTH'S CLOUD COVER. MOST REPORTS DEALT WITH REFLECTION AND TRANSMISSION, BUT ALSO THE PHYSICAL CHARACTERISTICS OF CLOUDS AS A SCATTERING MEDIUM. THE FIFTH SECTION WAS "LIGHT SCATTERING IN A CLOUDLESS ATMOSPHERE (DAYTIME SKY AND TWILIGHT)" (CHAIRMAN A. A. DMITRIYEV, 23 REPORTS).

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PROCESSING DATE--040EC70

CIRC ACCESSION NO--AP0132701

ABSTRACT/EXTRACT--MOST WERE DEVOTED TO DIRECT MEASUREMENTS AND  
COMPUTATIONS OF SKY BRIGHTNESS IN THE VISUAL, ULTRAVIOLET AND INFRARED  
REGIONS OF THE SPECTRUM.

UNCLASSIFIED



1/2 021 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--ISOBUTYLENE POLYMERS OR COPOLYMERS -U-  
AUTHOR-(04)-LIVSHITS, I.A., SHLIFER, D.I., KOVALEVA, G.V., SOUSTOVA, N.V.  
COUNTRY OF INFO--USSR  
SOURCE--U.S.S.R. 265,443  
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRATSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--09MAR70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ISOBUTENE, POLYMER, COPOLYMER, ISOPRENE, ALUMINUM HALIDE,  
CATALYTIC POLYMERIZATION, CHEMICAL PATENT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FAME--3002/1417 STEP NO--00/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0128816  
UNCLASSIFIED

2/2 021 UNCLASSIFIED PROCESSING DATE--13NOV70  
CIRC ACCESSION NO--AA0123816  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ISOBUTYLENE POLYMERS OR COPOLYMERS  
ARE PREPD. BY POLYMG. OR COPOLYMG. WITH, E.G., ISOPRENE IN A POLAR OR  
NONPOLAR HYDROCARBON SOLVENT AT MINUS 30 TO MINUS 1000+GREES BY USING AL  
HALIDE BASED CATALYSTS. TO OBTAIN END PRODUCTS WITH A SPECIFIED MOL.  
WT. FRACTION, THE POLYMN. PROCESS IS CARRIED OUT IN THE PRESENCE OF  
2,4,4,TRIMETHYL,1,PENTENE.

UNCLASSIFIED

USSR

UDC 621.396.69:621.319.4(088.8)

IVANOV, G. P., LIVSHITS, I. A.

"A Variable Capacitor"

USSR Author's Certificate No 260019, Filed 2 Dec 68, Published 27 Apr 70 (from  
RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10V331 P)

Translation: This Author's Certificate introduces a variable capacitor which contains rotor and stator plates and a mechanism for correcting the capacitance as a function of the angle of turn. The capacitor is made in the form of a flexible diaphragm resting on regulating screws. Pressed against this diaphragm is a correcting lever fitted with a roller on the end. As a distinguishing feature of the patent, correction precision is improved by making one of the end rotor plates spring supported and fitting it with a sleeve whose shoulder supports the free end of the correcting lever.

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USSR

UDC: 518.9

LIVSHITS, I. M., ROKHLIN, V. I., SPRYGINA-SLIK, S. D.

"On a Minimax Solution of One Problem of Distributing Resources"

V sb. Issled. Operatsiy. Vyp. 2 (Operations Research--collection of works. No 2), Moscow, 1971, pp 42-57 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V773)

Translation: The authors find the value of the minimax and the strategy which realizes it for the problem of distribution of offensive and defensive facilities among several sections for the case where the gain of the attacker on an individual section is proportional to the probability of a breach in the defense on this section by at least one of the attack facilities, and is equal to the value of the section if such a breach becomes certain. I. Fomin.

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1/2 006 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--MANGANESE GREEN PIGMENT -U-  
AUTHOR-(02)-GERBILSKIY, YE.I., LIVSHITS, I.M.  
COUNTRY OF INFO--USSR  
SOURCE--U.S.S.R. 264,571  
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--03MAR70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--PIGMENT, PATENT, MANGANESE COMPOUND  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3002/1465 STEP NO--UR/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0123864  
UNCLASSIFIED

2/2 006 UNCLASSIFIED PROCESSING DATE--13NOV70  
CIRC ACCESSION NO--AA0128864  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MANGANESE GREEN PIGMENT IS PREPD.  
BY CALCINING A CHARGE CONSISTING OF AN MN CONTG. COMPD., AN OXIDANT, AND  
BASO SUB4, LEACHING IT WITH HCL, WASHING THE OBTAINED MELT, WASHING THE  
ISOLATED PIGMENT, AND CALCINING AGAIN AT 800-900DEGREES.

UNCLASSIFIED

1/2 025 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--FILM FORMING PROPERTIES OF COPOLYMERS OF EPOXY ETHERS WITH ACRYLIC  
AND METHACRYLIC ACID ESTERS -U-  
AUTHOR--(03)-ZHEBROVSKIY, V.V., LIVSHITS, KH.M., VASILYEV, A.V.  
COUNTRY OF INFO--USSR  
SOURCE--LAKOKRASOCH. MATER. IKH PRIMEN. 1970, (2), 22-3  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, CHEMISTRY  
TOPIC TAGS--PLASTIC FILM, COPOLYMER, EPOXY COMPOUND, ETHER, FATTY ACID,  
EPOXY RESIN, ACRYLATE, TITANIUM DIOXIDE, PIGMENT, PLASTIC MECHANICAL  
PROPERTY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY FICHE NO----FD70/605019/B09 STEP NO--UR/0303/70/000/002/0022/0023  
CIRC ACCESSION NO--AP0140906  
UNCLASSIFIED

2/2 025  
CIRC ACCESSION NO--AP0140906

UNCLASSIFIED

PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ENAMELS WERE PREPD. BY COPOLYMER OF AN EPOXY ETHER (BASED ON FATTY ACIDS OF DEHYDRATED CASTOR OIL AND EPOXY RESIN E-44) WITH BU ACRYLATE AND BU METHACRYLATE IN THE PRESENCE OF CUMENE HYDROPEROXIDE. THE ENAMELS (CONTG. TIO SUB2 AS A PIGMENT) EXHIBITED SUPERIOR PHYS. MECH. PROPERTIES AND LIGHTFASTNESS.

UNCLASSIFIED



USSR

UDC 616.24-002-022:616.921.5-07:616.921.5-036.22"1967"

LIVSHITS, L. A., Kharkov, 22nd Clinical Hospital for Infectious Diseases

"Clinical Characteristics of Influenzal Pneumonia During the 1967 Influenza Outbreak"

Kiev, Vrachebnoye Delo, No 11, 1971, pp 140-143

Abstract A description of pathological signs observed in 62 patients (all males aged 16 to 40) with influenzal pneumonia caused by influenza antigens A<sub>2</sub> and B is given. The most important clinical findings include: a relatively mild course of the disease; polymorphism of auscultatory and X-ray data; discharge of blood-containing phlegm by patients with the most severe pneumonia; more frequent affliction of the left lung; frequent involvement of the pleura; small changes in the blood picture, including mainly monocytosis; and a temporary increase in blood sedimentation rate after termination of the inflammatory process. The patients were treated with penicillin, streptomycin, tetracycline, and sulfa drugs; all recovered.

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Mechanical Properties

USSR

UDC 539.4.015

YUSHCHENKO, K. A., STARTSEV, V. I., IL'ICHEV, V. Ya., NON'KO, G. G.,  
LIVSHITS, L. A., KAPLAN, L. I., STEPANOV, G. A., and GRUDZINSKIY, B. V.,  
Kiev, Institute of Electric Welding imeni Ye. O. Paton, Academy of  
Sciences, UkrSSR

"Low-Temperature Properties of Austenitic Steels"

Kiev, Problemy Prochnosti, No 10, Oct 70, pp 113-115

Abstract: A study was made of the mechanical properties of some steels of industrial melts destined for use at temperatures down to  $-269^{\circ}\text{C}$ . A low carbon content was characteristic for the investigated steels, and some were also alloyed with nitrogen. The 21-16-8-N type stable-austenitic steel had the best strength properties and smallest reduction in plasticity and toughness at reduced temperatures.

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Physical Properties

USSR

UDC: 669.01.018.5:669.734:538.21

DEMENT'YEVA, G.P., LIVSHITS, B.G., LIVSHITS, L.B., and MILAYEV, I.M., Moscow  
Institute of Steel and Alloys

"Magnetic Properties of Cast Hard-Magnetic Alloys in the System Manganese --  
Aluminum -- Carbon"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 5, 1970,  
pp 120-122

Abstract: Studies were made to determine the technological possibilities and prospects of Mn -- Al -- C cast alloys as permanent-magnet materials to compete with alloys containing nickel and cobalt. In the experiments, the alloy (chemical analysis: 71.3% Mn, 28.2% Al, 0.99% C) was melted in a 5-kg induction furnace in an argon atmosphere (in an alumina crucible) and poured into 13-15-mm-diameter quartz tubes 150-180 mm in length. Branc MRO manganese, brand AVOCO aluminum, and carbon in the form of graphite were used for the melt. All specimens were homogenized at a temperature of 1100°C for one hour. According to the curves of magnetic property changes after normalization from 1100°C and tempering, it was determined that the maximal magnetic properties are obtained after a 15-minute holding time at a tempering temperature of 650°C. Carbon, in addition to improving the magnetic properties, increases the hardness and brittleness of Mn -- Al alloys and promotes directional crystallization. On the basis of the results obtained, it was postu-  
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USSR

DEMENT'YEVA, G.P., et al, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 5, 1970, pp 120-122

lated that the cast Mn -- Al -- C alloy could replace certain Fe -- Mn -- Al cast alloys containing up to 30% Ni. However, additional measures will be required to lower the susceptibility of the Mn -- Al -- C alloy to crack formation in heat treatment.